

Remarks**I. Status of the Application**

Claims 1-74 are pending in the application. Claims 1-48 have been allowed. Claims 1, 12, 13, 24, 25, 36, 37, and 48 are amended. Claim 49-74 are added.

II. Amendments to the Claims

Claims 1, 12, 13, and 24, have been amended to improve the language of the claims. The amendments do not affect the scope of the claims.

Claims 25 and 37 have been amended to replace the language “one or more data storage systems for” by “one or more data storage systems configured to,” and the language “a processor for” by “a processor configured to,” to avoid any inference that the limitations should be interpreted as means-plus-function limitations. These amendments are not being made in response to a rejection, and they broaden the scope of the respective claims. Claims 36 and 48 have been amended to conform to amended claims 25 and 37, respectively.

These amendments should not affect the allowability of the claims.

III. New Claims 49-74

New independent claim 49 defines a method to store data in a storage system comprising at least one first storage device and at least one second storage device. The method recited by new claim 49 comprises “storing first data in at least one first storage device,” and “storing the first data stored in the at least one first storage device in at least one second storage device.” New claim 49 further comprises “determining a condition,” and, in response to the condition,

“storing second data in the at least one first storage device,” and “recording one or more memory locations associated with the storing of the second data in the at least one first storage device.”

Support for new claim 49 is found at pages 16-21, for example.

None of the cited art teaches or suggests the combination of new claim 49. Therefore, new claim 49 is patentable over the cited art.

New claim 50 depends from claim 49, and further requires “determining a second condition.” In response to the second condition, new claim 50 requires “copying the second data from the at least one first storage device to the at least one second storage device, based at least in part on the one or more recorded memory locations.” New claim 51 depends from claim 50, and further requires “detecting a change of the condition to the second condition.” New claim 52 depends from claim 51 and comprises “storing the first data in the at least one first storage device and in the at least one second storage device by continuous replication.” Support for new claims 50-52 is found at pages 16-21, for example.

New claim 53 depends from claim 51 and specifies that the storing of data by continuous replication comprises “receiving a request to store specified data from a client computer,” “inserting the specified data in a memory, transmitting an acknowledgment message to the client computer.” Claim 53 additionally requires “transmitting the specified data to the at least one first storage device and to the at least one second storage device,” and “removing the data item from the memory.” Support for new claim 53 is found at pages 14-15, for example.

New claim 54 depends from claim 51 and recites “wherein the condition comprises a status of a communication connection between the at least one first storage device and the at least one second storage device.” New claim 55 depends from claim 54 and recites “wherein the

condition occurs when the communication connection is interrupted.” New claim 56 depends from claim 55 and recites “wherein the second condition occurs when the communication connection is in a functioning condition.” Support for new claims 54-56 is found at pages 16, for example.

New claim 57 depends from claim 51 and also recites “wherein the condition is determined by determining a difference between a rate at which data are transmitted to the at least one first storage device and a rate at which data are read from the at least one first storage device and transmitted to the at least one second storage device.” Support for new claim 57 is found at page 22, line 7 to page 23, line 2, for example.

New claim 58 depends from claim 51 and recites “wherein the condition is determined by determining a quantity of data currently stored in a selected storage device.” Support for new claim 58 is found at page 23, lines 10-16, for example.

New claim 59 depends from claim 51 and recites “wherein the condition is determined by determining a level of redundancy within data currently stored in a selected storage device.” New claim 60 depends from claim 59 and recites “wherein the level of redundancy within data currently stored in the selected storage device is determined by computing a ratio of (1) a first quantity of data that must be transferred from the at least one first storage device to the at least one second storage device if a first method is used to back up data currently stored in the at least one first storage device, to (2) a second quantity of data that must be transferred from the at least one first storage device to the at least one second storage device if a second method is used to back up data currently stored in the at least one first storage device.” Support for new claims 59-60 is found at page 23, line 19 to page 28, line 17, for example.

New claim 61 depends from claim 51 and further comprises “recording one or more data blocks in which second data is stored in the at least one first storage device.” Support for new claim 61 is found at page 17, for example.

As stated above, new claim 49 is patentable over the cited art. Therefore, new claims 50-61, which depend from new claim 49, are also patentable over the cited art.

New claim 62 defines a method to store data in one or more data storage systems. New claim 62 requires “storing data pursuant to a selected storage mode comprising storing the data in at least one first storage device and in at least one second storage device,” and “detecting a first condition pertaining to an activity associated with the storing of the data.” In response to the detected first condition, new claim 62 requires “storing data in the at least one first storage device,” and “recording in a database information identifying one or more data blocks in the at least one first storage device that are changed.” Claim 62 further requires “detecting a second condition pertaining to the activity,” and “copying the one or more data blocks from the at least one first storage device to the at least one second storage device, based on the information, in response to the detected second condition.” Support for new claim 62 is found at pages 16-21, for example.

None of the cited art teaches or suggests the combination of new claim 62. Therefore, new claim 62 is patentable over the cited art.

New claim 63 depends from claim 62, and further comprises “detecting a change of the first condition to the second condition.” New claim 64 depends from claim 62 and further recites “wherein the selected storage mode comprises continuous replication.” New claim 65 depends from claim 64 and further recites “wherein the continuous replication is performed

synchronously.” New claim 66 depends from claim 64 and further recites “wherein the continuous replication is performed asynchronously.” New claim 67 depends from claim 62 and recites “wherein the first condition comprises a condition of a communication connection between the at least one first storage device and the at least one second storage device.” Support for new claims 63-67 is found at pages 16-21, for example.

As discussed above, new claim 62 is patentable over the cited art. Therefore, new claims 63-67, which depend from new claim 62, are also patentable over the cited art.

New claim 68 defines a method to store data in a storage system comprising at least one first storage device and at least one second storage device and being capable of having at least a first status of a condition and a second status of the condition. New claim 68 requires “receiving a request to store data,” and “checking a status of a condition of the storage system.” If the first status is detected, new claim 68 requires “causing the data to be stored in the at least one first storage device and in the at least one second storage device.” If the second status is detected, new claim 68 requires “storing the data in the at least one first storage device” and “recording one or more storage locations of the stored data in the at least one first storage device.”

None of the cited art teaches or suggests the combination of new claim 68. Therefore, new claim 68 is patentable over the cited art.

New claim 69 depends from claim 68 and further comprises “checking a second status of the condition,” and, if it is determined that the second status has changed to a third status, “copying data from the at least one first storage device to the at least one second storage device, based at least in part on the one or more recorded storage locations.”

As discussed above, new claim 68 is patentable over the cited art. Therefore, new claim 69, which depends from new claim 68, are also patentable over the cited art.

New claim 70 depends from amended claim 1, and further comprises “monitoring for a change in the criterion to a second status.” New claim 71 depends from amended claim 13, and further comprises “monitoring for a change in the criterion to a second status.” New claim 72 depends from amended claim 25, and recites “wherein the processor is further configured to monitor for a change in the criterion to a second status.” New claim 73 depends from amended claim 37, and recites “wherein the processor is further configured to monitor for a change in the criterion to a second status.” As discussed above, amended claims 1, 13, 25, and 37 are allowable over the cited art. Therefore, new claims 70-73, which depend from amended claims 1, 13, 25, and 37, respectively, are also allowable over the cited art.

New claim 74 defines a system to store data. The system recited by new claim 74 comprises “at least one first storage device configured to store data,” and “at least one second storage device configured to store data.” Claim 74 further requires a processor configured to “store first data in the at least one first storage device,” and “cause the first data from the first storage device to be stored in at least one second storage device.” The processor is also configured to “determine a condition,” and, in response to the condition, “store second data in the at least one first storage device” and “record one or more memory locations associated with the storing of the second data in the at least one first storage device.”

None of the cited art teaches or suggests the combination of new claim 74. Therefore, new claim 74 is patentable over the cited art.

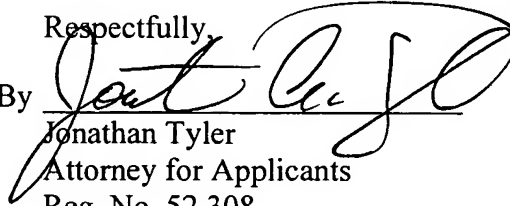
IV. Comment on Examiner's Reasons for Allowance

A Notice of Allowance was issued on September 8, 2006, in which claims 1-48 were allowed. In the Notice of Allowance, the Examiner stated in the "Reasons For Allowance" that he has given the claimed terminology "delta replication operating mode" the scope of meaning as disclosed in the Specification, page 3, lines 1-2, page 17, line 5 - page 21, line 10, and Figures 4-6.

It is noted that other examples of "delta replication," "delta replication method," and "delta replication operating mode" are provided elsewhere in the Specification, such as at page 29, lines 2-19, for example. It is respectfully submitted that during prosecution, the claims should be given their broadest reasonable interpretation consistent with the Specification." MPEP 2111, quoting *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000).

V. Conclusion

In view of the foregoing, each of claims 1-74, as amended, is believed to be in condition for allowance. Accordingly, entry and reconsideration of these claims are respectfully requested.

Respectfully,
By 
Jonathan Tyler
Attorney for Applicants
Reg. No. 52,308
212-836-8653

Date: December 7, 2006